

**INFORMATION SHEET GENERAL RADIATION EXPOSURE  
FOR CONSTRUCTION WORKERS  
STREETERVILLE AREA  
CHICAGO, ILLINOIS**

Gamma surveys in Streeterville have indicated that subsurface soil may potentially contain thorium (a naturally occurring radioactive material). The thorium is apparently the result of manufacturing activities in the 1910s to 1930s in the Streeterville area. As a result of the previous investigations, screening for contaminated soil was undertaken at the project site. Because radioactivity can be hidden if buried beneath a sufficiently thick cover of soil or pavement, monitoring for radioactivity will still be necessary for subsurface (excavation) activities at the site unless the area was previously screened. However, a benefit of a thick cover of soil or pavement is that it also prevents and/or eliminates potential exposure.

An investigation/remediation plan has been developed for the site to provide a means of eliminating and/or minimizing the potential for worker exposure to the contamination. The goal of this plan is to prevent exposure of workers and the public. Should contamination be discovered, access to these areas will be restricted via fencing and handling of the material will be done by appropriately trained personnel. Persons who are involved in the handling, loading and transport of the impacted soil (i.e., have potential for contact with the radiologically-contaminated soil) will be required to be HAZWOPPER health and safety trained. Other persons on the site are required to be familiar with the excavation monitoring requirement and access restrictions for the fenced areas where radiologically-impacted material may potentially exist.

Radioactivity can be hazardous if the exposure is for a long duration and/or if the dose is sufficiently high. Protection is provided by reducing the exposure through removal of the contamination, by providing shielding or maintaining a distance from contamination, by preventing contact with the contamination, and minimizing exposure time. The monitoring (and if necessary removal efforts) at the site will be managed to minimize or eliminate potential exposure (i.e., keep exposure as low as reasonably achievable). If remediation is necessary, air monitoring will be conducted during contaminated soil removal efforts and trained personnel working in close proximity to the contaminated soil will be issued personal monitoring equipment to measure radiation doses. Historically, the results of air and film badge (personal) monitoring have shown that the procedures utilized provide a safe work environment for those involved directly in the cleanup effort as well as others at the site.

In summary, monitoring will be provided to identify radiologically-contaminated soil that might be encountered in the course of construction activities. The monitoring and potential removal efforts will be managed to minimize and/or eliminate potential exposure. If identified, radiologically-contaminated areas will be fenced to restrict access and the material will be removed to clean limits by personnel trained in the handling of this material. Additional questions regarding radiation issues can be directed to Steve Kornder of AECOM, Inc. (262-515-7700), who is providing environmental management at the Site, or the U. S. Environmental Protection Agency (312-886-3601).

This fact sheet answers the most frequently asked health questions (FAQs) about thorium. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Thorium is a radioactive substance that occurs naturally in the environment. It has been shown to cause an increase in cancers of the lung, pancreas, and blood in workers exposed to high levels of it in the air. This chemical has been found in at least 16 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

## What is thorium?

Pronounced (thôr'ē-əm)

Thorium is a naturally occurring, radioactive substance. In the environment, thorium exists in combination with other minerals, such as silica. Small amounts of thorium are present in all rocks, soil, water, plants, and animals. Soil contains an average of about 6 parts of thorium per million parts of soil (6 ppm).

More than 99% of natural thorium exists in the form of thorium-232. It breaks down into two parts—a small part called “alpha” radiation and a large part called the decay product. The decay product is also not stable and continues to break down through a series of decay products until a stable product is formed. During these decay processes, radioactive substances are produced. These include radium and radon. These substances give off radiation, including alpha and beta particles, and gamma radiation.

Some rocks in underground mines contain thorium in a more concentrated form. After these rocks are mined, thorium is usually concentrated and changed into thorium dioxide or other chemical forms. After most of the thorium is removed, the rocks are called “depleted” ore or tailings.

Thorium is used to make ceramics, gas lantern mantles, and metals used in the aerospace industry and in nuclear reac-

tions. Thorium can also be used as a fuel for generating nuclear energy.

## What happens to thorium when it enters the environment?

- ☐ Thorium is a natural part of the environment.
- ☐ Thorium changes extremely slowly into other radioactive substances.
- ☐ It takes about 14 billion years for half of the thorium-232 to change into new forms.
- ☐ As rocks are broken up by wind and water, the thorium and all other components of the rocks become part of the soil.
- ☐ Thorium in soil can be washed into rivers and lakes.
- ☐ Windblown dust and volcanic eruptions are natural sources of thorium in the air.
- ☐ Burning coal may release small amounts of thorium into the air.
- ☐ Mining thorium or making products that contain it may also release thorium into the environment.

## How might I be exposed to thorium?

- ☐ Just by being alive, everyone is exposed to small amounts of thorium in air, water, and food.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

- ☐ Breathing air near facilities where uranium, phosphate, or tin ore is processed.
- ☐ Living in homes built on soil with high levels of thorium.
- ☐ Working in the uranium, thorium, tin, and phosphate mining, and gas mantle production industries may expose you to higher levels of thorium.
- ☐ Living near radioactive waste disposal sites.

### How can thorium affect my health?

Studies on thorium workers have shown that breathing high levels of thorium dust results in an increased chance of getting lung disease. Liver diseases and effects on the blood were found in people injected with thorotrast, a thorium compound injected into the body as a radiographic contrast medium between the years 1928 and 1955. Animal studies have shown that breathing thorium may result in lung damage.

Studies on exposed human populations have not reported any birth defects or effects on a person's ability to have children.

### How likely is thorium to cause cancer?

Workers who had high exposures to cigarette smoke, radon gas, and thorium had cancers of the lung, pancreas, and blood. People who had large amounts of thorium injected into their blood for special x-ray tests had more than the usual number of liver tumors, cancers of the blood, such as leukemia, and tumors of the bone, kidney, spleen, and pancreas.

### Is there a medical test to show whether I've been exposed to thorium?

Special tests that measure the level of radioactivity from thorium in your urine and feces, and radon gas in the air you exhale can determine if you have been exposed to thorium.

These tests are only useful if done within several days to a week after exposure. The tests cannot tell you if your health will be affected by the exposure. They require special equipment and are probably not available at your local clinic or hospital.

### Has the federal government made recommendations to protect human health?

The EPA has set a drinking water limit of 15 picocuries per liter (15 pCi/L) of water for gross alpha particle activity and 4 millirems per year for beta particles and photon activity (for example, gamma radiation and x-rays).

The federal recommendations have been updated as of July 1999.

### Glossary

CAS: Chemical Abstracts Service.

National Priorities List: A list of the nation's worst hazardous waste sites.

Millirem (mrem): A unit used to measure radiation dose.

Picocurie (pCi): A unit used to measure the intensity of radiation.

ppm: Parts per million.

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for thorium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.





# Lindsay Light Sites Update

Chicago, Illinois

April 2000

## INTRODUCTION

The purpose of this fact sheet is to provide community residents and other interested individuals with information about the Lindsay Light sites. In particular, this fact sheet will provide a brief overview of cleanup activities at each site with background information on the company and contacts for additional information.

## LINDSAY LIGHT BACKGROUND

The Lindsay Light Chemical Company is the former maker of incandescent gas mantles for home and street lighting. Earlier reports show this company first imported and then manufactured mantles from around 1910 until 1933 at 161 East Grand Avenue. Sometime after 1933, Lindsay Light moved to West Chicago, Illinois.

The process of gas mantle manufacturing involves dipping gauze mantle bags into solutions containing thorium nitrate and small amounts of cerium, beryllium and magnesium nitrates. The principal ingredient in thorium nitrate is radioactive thorium, specifically, thorium-232.

## LINDSAY LIGHT I SITE

The Lindsay Light I site is located at 161 East Grand Avenue, at the corner of Grand Avenue and St. Clair Street in downtown Chicago. Lindsay Light I is the former manufacturing location for the Lindsay Light

Chemical Company. The U.S. Environmental Protection Agency took a series of surveys and recommended that decontamination of areas throughout the building be undertaken, where practicable (areas where employees and members of the general public work or frequent). In August 1981, the current building owners funded a limited project to decontaminate only occupied work areas on the second and fourth floors. During June 1983 and February 1984, U.S. EPA took dose measurements to determine what, if any, levels of radiation were present. On both occasions results were minimal.

In June 1993, a site assessment was performed to measure gamma exposure rates. This assessment concluded that there were additional areas that should be removed.

## LINDSAY LIGHT II SITE

The Lindsay Light II Site, which is a public parking lot, is located at 316 East Illinois Street. The three acre lot is bounded by Grand Avenue, Illinois Street, McClurg Court and Columbus Drive. Records show that the Lindsay Lite II Site originally housed a stable, which was later used as a laboratory/processing facility by the former Chemical company. A site assessment was done in June 1993, which determine the extent of cleanup activities.

## **LINDSAY LIGHT III SITE**

Lindsay Light III is located at 22 West Hubbard Street. Records indicate that this location was once a home of the Lindsay Light Chemical Company. A site assessment occurred at 22 and 30 West Hubbard (adjacent buildings) which showed minimal levels that posed no immediate health and safety actions. Surveys were conducted at 30 West Hubbard due to the common wall shared by the two buildings.

## **LINDSAY LIGHT II SITE/RV3 NORTH COLUMBUS DRIVE**

The Lindsay Light II Site/RV3 Columbus Drive is located at 316 East Illinois Street directly across the street from the Lindsay Light II removal site. This property was detected during a U.S. EPA walkover radiation survey of the property. During this walkover the presence of thorium was discovered. These levels were cross-checked through the Argonne National Laboratory. As a result, U.S. EPA expanded the Lindsay Light II cleanup project to include the North Columbus Drive property (known as the Lindsay Light II Site/RV3 North Columbus Drive).

A workplan to cleanup this property was finalized and approved on March 24, 2000. Cleanup activities are scheduled to begin in early April 2000.

## **FOR ADDITIONAL INFORMATION**

If you have questions about the information in this fact sheet or would like additional information about the Lindsay Light Sites, please contact the individuals listed below:

**Derrick Kimbrough**  
Community Involvement Coordinator  
Office of Public Affairs (P-19J)  
(312) 886-9749  
kimbrough.derrick@epa.gov

**Verneta Simon**  
On-Scene Coordinator  
Superfund Division (SE-5J)  
(312) 886-3601  
simon.verneta@epa.gov

**U.S. EPA Region 5**  
**77 West Jackson Boulevard**  
**Chicago, Illinois 60604-3590**  
**(800) 621-8431**

Lindsay Light site-related information is available at the following location:

**Harold Washington Public Library**  
**400 South State**  
**Chicago, Illinois**

Monday: 9:00 a.m. to 7:00 p.m.  
Tues. and Thurs.: 11:00 a.m. to 7:00 p.m.  
Wed., Fri., and Sat.: 9:00 a.m. to 5:00 p.m.

### **60 Second Safety Check**

Stop and think before you start work or  
when the work changes –

- Do we know the task at hand?
- Do we have the right tools?
- Do we have the right equipment?
- Do we have the right materials?
  - Do we need information about the material or product?
- Do we have the right Personal Protective Equipment?
  - Harness, face shield, etc.?
  - Do we know how to use the PPE correctly?
- Do we need additional equipment?
- Do we need additional specific training for this task?
- Do we have adequate help to accomplish this work safely?
- Do we know what to do in case of an emergency?

**Safety First**

**McHUGH**